BLOOD LEAD LEVELS IN CALIFORNIA WORKERS, 1995-1999

Report of the California Occupational Blood Lead Registry

EXECUTIVE SUMMARY

Lead poisoning continues to be a serious occupational health problem in California. The California Department of Health Services (CDHS) received thousands of reports of elevated blood lead levels (25 micrograms per deciliter or greater) in workers during the five-year period from January 1, 1995 to December 31, 1999 (2,657 individuals). Since the majority of lead-exposed workers never receive a blood lead level test, this figure significantly underestimates the extent of work-related lead poisoning in California.

Overexposure to lead causes serious health effects in adults, including injury to the nervous system, kidneys, blood-forming, and reproductive systems in men and women. The blood lead level reflects the amount of lead currently found in the blood and soft tissues. This may be from recent external exposure as well as from the slow release of any lead stored in bones from past exposures. There is no known "safe" level of lead in the blood.

Laboratories performing blood lead analyses on California residents are required to report blood lead levels (BLLs) 25 micrograms of lead per deciliter of blood (µg/dl) or greater to the CDHS. The Occupational Lead Poisoning Prevention Program (OLPPP) within CDHS receives reports for adults 16 years of age and over who are exposed to lead in the workplace. These data are recorded in the **California Occupational Blood Lead Registry** operated by OLPPP. OLPPP uses these data to identify serious cases of work-related lead poisoning requiring follow-up, estimate the magnitude and distribution of lead poisoning in California industries, and identify high risk industries for targeted prevention activities.

In this report we summarize the findings for 1995-1999, describe the operation of the system, discuss its limitations, review Registry-guided prevention efforts in high-risk industries, and review the efforts of CDHS/OLPPP to improve tracking of work-related lead poisoning in California.

Key Findings

Key findings of the Registry for the period 1995-1999 are:

- Elevated blood lead level reports (25 µg/dl or greater) were received for 2,657 individuals. Five hundred fifty-seven had a peak BLL 40 µg/dl or greater and may have suffered serious damage to their health.
- The overwhelming majority of individuals (94%) reported to the

Registry were male, with an age range typical of a working population (95% between 20 and 59 years of age).

- Individuals with Spanish surnames were disproportionately represented; California's workforce is 28% Hispanic, whereas the proportion of Spanish surnames among individuals reported to the Registry was 52%.
- A large proportion (42%) of workers with BLLs 25 µg/dl or greater were employed in Los Angeles County. This reflects the concentration of California lead industries in this county.
- Reports of elevated BLLs were not confined to a few industries; individuals reported to the Registry worked in 117 different industries.
- The majority of persons reported to the Registry with elevated BLLs worked in manufacturing (64%) including lead-acid battery manufacture, nonferrous secondary smelters, and manufacture of non-tableware pottery products. Individuals were also employed in construction (18%) and service industries (13%). Construction industries include painting, wrecking and demolition, and masonry (furnaces in lead smelters). Service industries include radiator repair shops and firing ranges.
- Progress has been made in reducing worker lead exposure in the lead-acid battery manufacturing and battery recycling industries; since 1995 no battery workers have been identified with BLLs 60 µg/dl or greater. However, the hundreds of individuals with elevated BLLs indicate that additional effort is needed to reduce worker exposure.
- Thirty-nine cases of workers with serious lead poisoning (BLLs ranging from 60 to 221 µg/dl) and 41 cases of take-home lead poisoning (40 children and one adult with BLLs ranging from 10 to 52 µg/dl) were identified and investigated by OLPPP. Painting and radiator repair had the largest number of cases of lead poisoning in workers. Among take-home cases, the largest number of children affected had household members in the radiator repair industry.
- As in prior years, many lead poisoning cases were linked to a lack of awareness of lead hazards and how to control them, even in industries where the risks of lead exposure are well known to occupational health professionals. Small businesses in particular have difficulty in setting up a lead safety program and need education and technical assistance.
- Compliance with the BLL testing requirements of the Cal/OSHA lead standards varies by industry but is poor among many industries that use or disturb lead.

Limitations of Registry Data

The data presented in this report are incomplete and do not fully describe the magnitude and distribution of lead poisoning in California industries. The data are incomplete because many employers fail to provide BLL testing to their lead-exposed workers. Published reports and OLPPP's census results indicate that the majority of lead-exposed workers do not receive BLL testing. The result of this large-scale deficiency in testing is that a large proportion of the true number of workers with elevated BLLs will not be captured by the Registry. Additionally, we cannot determine the relative risk of lead poisoning among industries since the proportion of employers testing varies widely by industry. In some industries, the percentage of employers providing testing is so low we have little idea of the prevalence of lead poisoning in those industries.

Registry data are also incomplete because laboratories are not required to report BLLs below 25 µg/dl. Without reporting of all (not just elevated) BLLs, we cannot calculate the proportion of workers with

elevated BLLs, even among those groups of workers being tested, nor can we track the progress of employers in reducing worker exposure to lead, or identify employers who fail to provide required BLL testing.

Improving Tracking of Occupational Lead Poisoning

Improved tracking of occupational lead poisoning will allow OLPPP to better identify problem industries and employers so that we may target them for prevention activities. CDHS is currently pursuing a requirement for the reporting of *all*, not just elevated, BLL test results. OLPPP is working to expand routine BLL testing by educating lead-using industries, unions, and health professionals about the importance of BLL testing and Cal/OSHA's BLL testing requirements. In addition, OLPPP has begun to develop a specific strategy for increasing BLL testing among California's industrial/commercial contractors. OLPPP plans to do similar work in general industry in the future.

Registry Data Guide OLPPP's Prevention Activities

While Registry data do not currently provide us a complete picture of lead poisoning in California industry, they do provide valuable information which guides OLPPP's prevention activities. Since 1995, OLPPP has carried out targeted education and intervention activities in five of the industries identified as high risk by Registry data. The industries are residential painting, industrial/commercial construction, radiator repair, scrap metal recycling, and firing ranges. Individual case investigations also lead to broader efforts to prevent lead poisoning. OLPPP alerted health professionals and employers to the significant risk of lead poisoning in plastics compounding and furniture refinishing after investigating serious lead poisoning cases in these industries.

Conclusion

Despite the limitations of the data, the Occupational Blood Lead Registry provides valuable information on lead poisoning in California workplaces. Registry data indicate that, although it is completely preventable, lead poisoning still occurs on a large scale in California. The problem appears widespread and is not confined to a few industries.

Revisions to the CDHS laboratory reporting requirements will improve our ability to calculate the distribution of BLLs in specific groups of interest and to track employer compliance with Cal/OSHA testing requirements. However, until the majority of employers provide routine BLL testing to their lead-exposed workers, we cannot fully describe the magnitude and distribution of occupational lead poisoning in California. OLPPP will continue its efforts to increase the number of employers doing BLL testing through education and targeted intervention activities. With more complete tracking data we will be better able to identify problem employers and industries and carefully target limited resources to those most in need.